City of Boston Briefing

The "BOSS"

Boston One-Stop Spatial Server

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Project Status

- 14 departments were interviewed during the months of July and August 2003.
- Draft write-ups of interviews were provided to each department for review.
- A final document entitled "Findings on the Status of GIS in the City of Boston; *Recommendations for a new GIS Architecture."* was delivered to MIS in September.
- The recommended hardware for implementation has been provided by MIS.
- ESRI is well underway with application development.
- MIS and ESRI are interested in feedback from City staff today…….

Appendix B—Use Case Examples

1.0 What is a Use Case?

At the center of the proposed enterprise GIS architecture is a repository of GIS data and metadata stored within and industry-standard DBMS, a spatial data clearinghouse. How users access and interact with these spatial and metadata in the clearinghouse is of critical importance. The following discussion provides a number of workflows comprising the steps an average user would follow to accomplish the following three key tasks:

- Discover spatial data
- Quickly create maps
- Update and maintain a seamless, citywide spatial repository

These detailed descriptions of the step-by-step process to accomplish these tasks are called 'use cases'. The tasks are accomplished using an easy-to-use application designed and built using web development tools. The resulting web application is referred to herein as a 'web portal' or 'portal' into the clearinghouse.

1.1 Discovering and Mapping Data

Searching for spatial data will be conducted through a customized version of the U.S. government Geodata.Gov web page (GOS), a Java Server Page application. Users locate data with GOS in two ways. They can browse all available data, or they can search based upon a geographic area, metadata field, or a spatial restriction, such as a bounding rectangle. Whether they're browsing or searching, detailed metadata will assist the user in determining whether the data applies to their work. Examples of common metadata fields are, when the data was last updated, who the author is, who the publishing agency is, the area of coverage, and a thumbnail image. If necessary, access to GOS can be secured and require a username and password before users can search the repository. Additionally, if the site is made password protected, search results and capabilities can be restricted by access levels or logins in such a way that only if a user is a member of a certain user group will they even know that certain layers exist in the spatial data clearinghouse.

Once the user has located the data of interest, they will have three ways to view and use the data.

- Add the data to ArcExplorer Web, a web viewer developed for use with the Geography Network and GeoData.gov. (http://www.esri.com/software/arcexplorer/overview_aewebhtml, http://www.geodata.gov)
- Add the data to ArcGIS as an ArcIMS map service
- Download the data in shapefile format

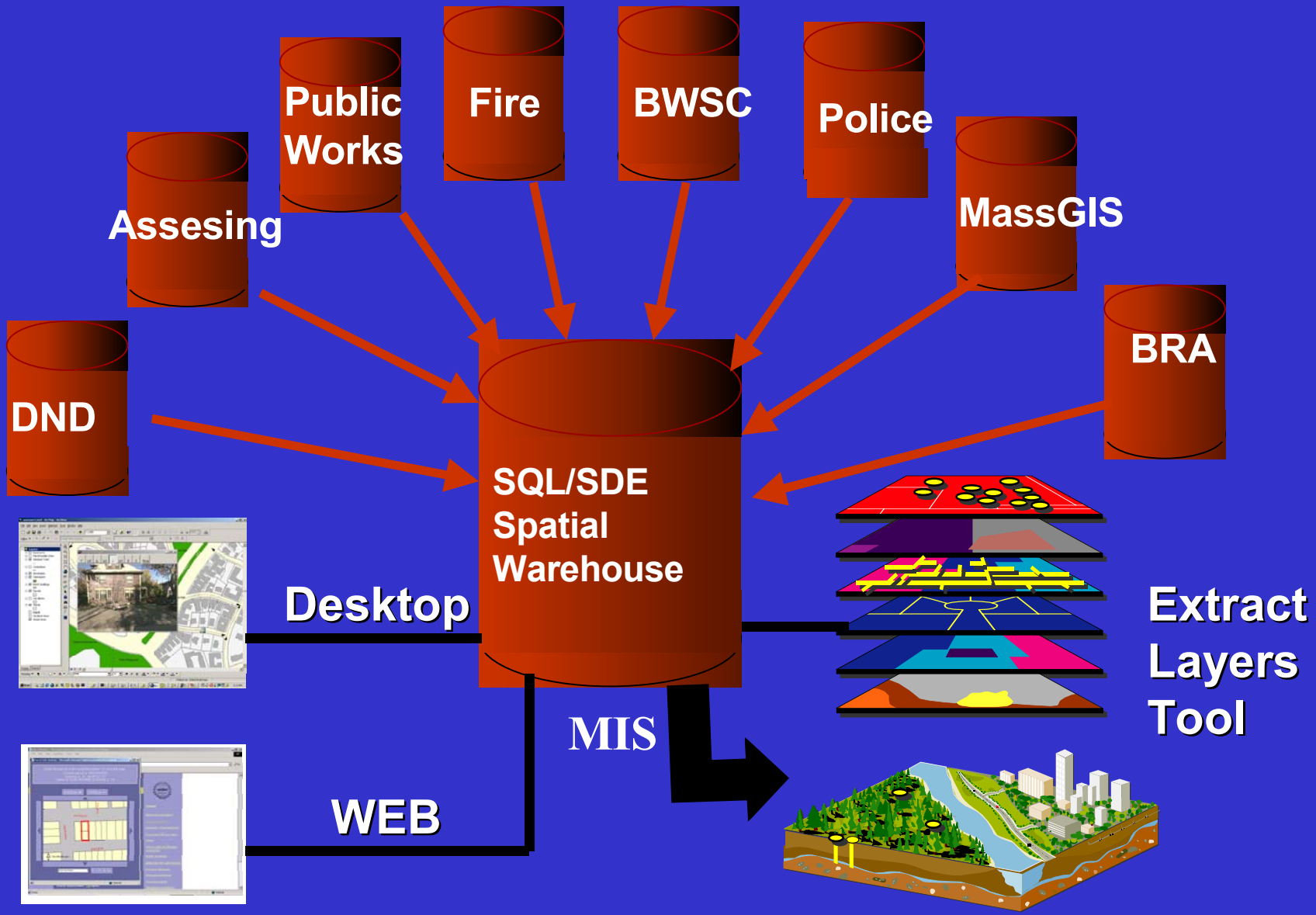
Findings (1)

- Despite incremental and steady data creation activities throughout the City, the core GIS basemap data are rapidly becoming outdated.
- There is significant data duplication throughout the City that has resulted in a lack of knowledge about who updates data layers, what the current, most up-to-date data are, and how the data can be shared.
- There is very little investment in metadata (data about the data) ongoing.
- The City has grown its GIS assets, both it's physical infrastructure, its data, and its personnel, to a point where the need for a coordinating mechanism has become critical.

Findings (2)

- There will need to be some selective hardware upgrades for GIS
- Most departments within the City identified GIS training as an important requirement
- The City should promote thin client deployments of GIS. Most departments rely on desktop deployments of GIS (thick clients).
- In many cases there is no official responsibility for departments to maintain GIS data layers.
- Few GIS data models have been developed in the city. Developing standardized data models will allow departments to share geographic information in a common language.

High Level BOSS Architecture



Recommendations

ESRI is recommending a phased approach to MIS comprised of the following:

1. The establishment of a spatial data clearinghouse for the City of Boston

2. The development of a ‘common application’ for view and inquiry of the GIS data in the Spatial Data Clearinghouse

3. The establishment of a metadata catalog and the integration of metadata catalog information as a fundamental part of the application

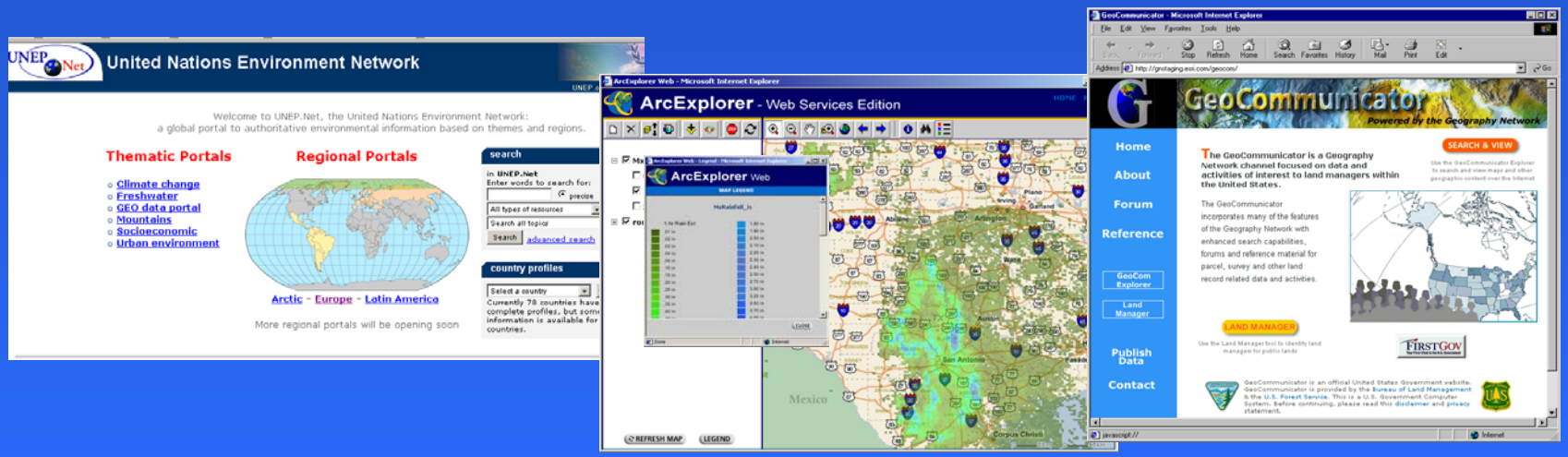
An Approach Based on the Geospatial One-Stop

Sets a Bold New Course:

- Inclusive and owned by the City
- Minimal effort to share and find data and services
- 2 Clicks to content!
- Enhanced search capabilities
- Accessible from Browser and GIS
- Applications can be added over time

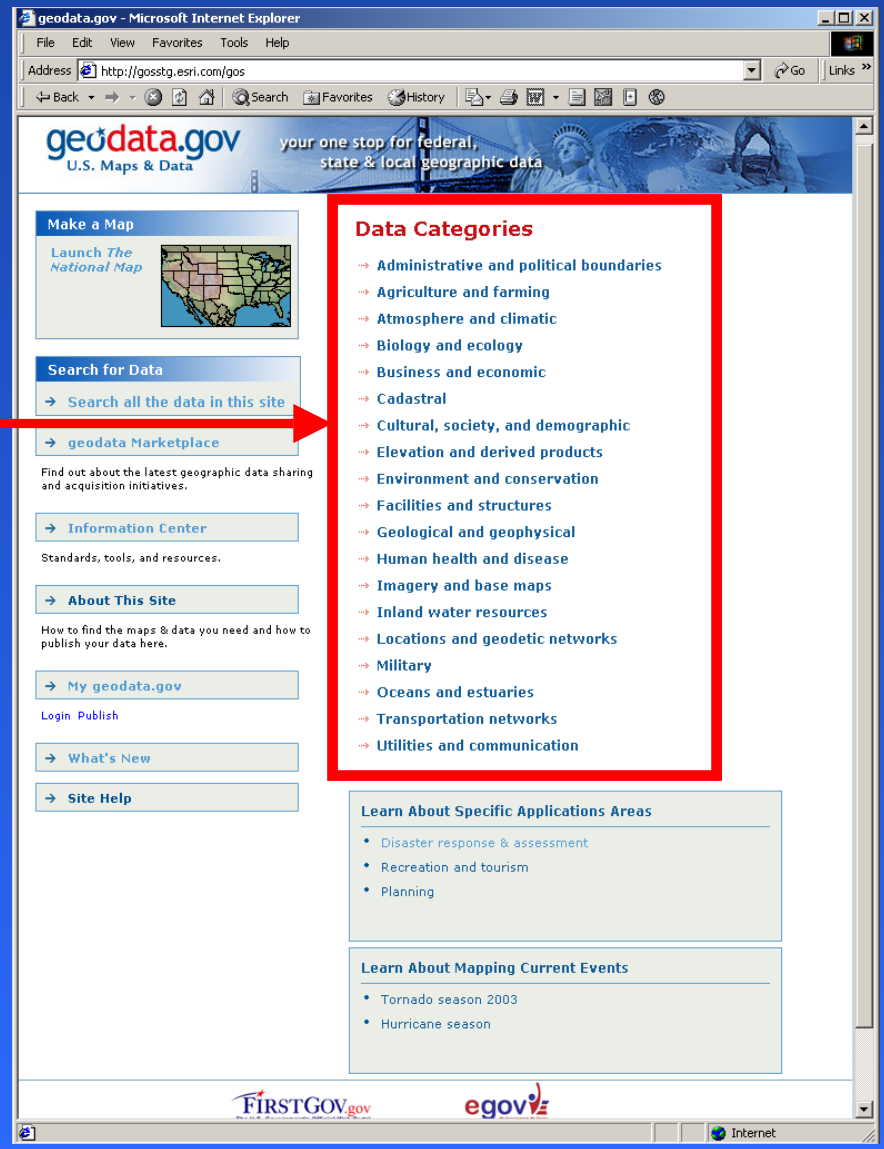
Building Blocks

- Commercial off-the-shelf products
- Open standards
- Experience from real implementations (international, federal, state)



Data Categories

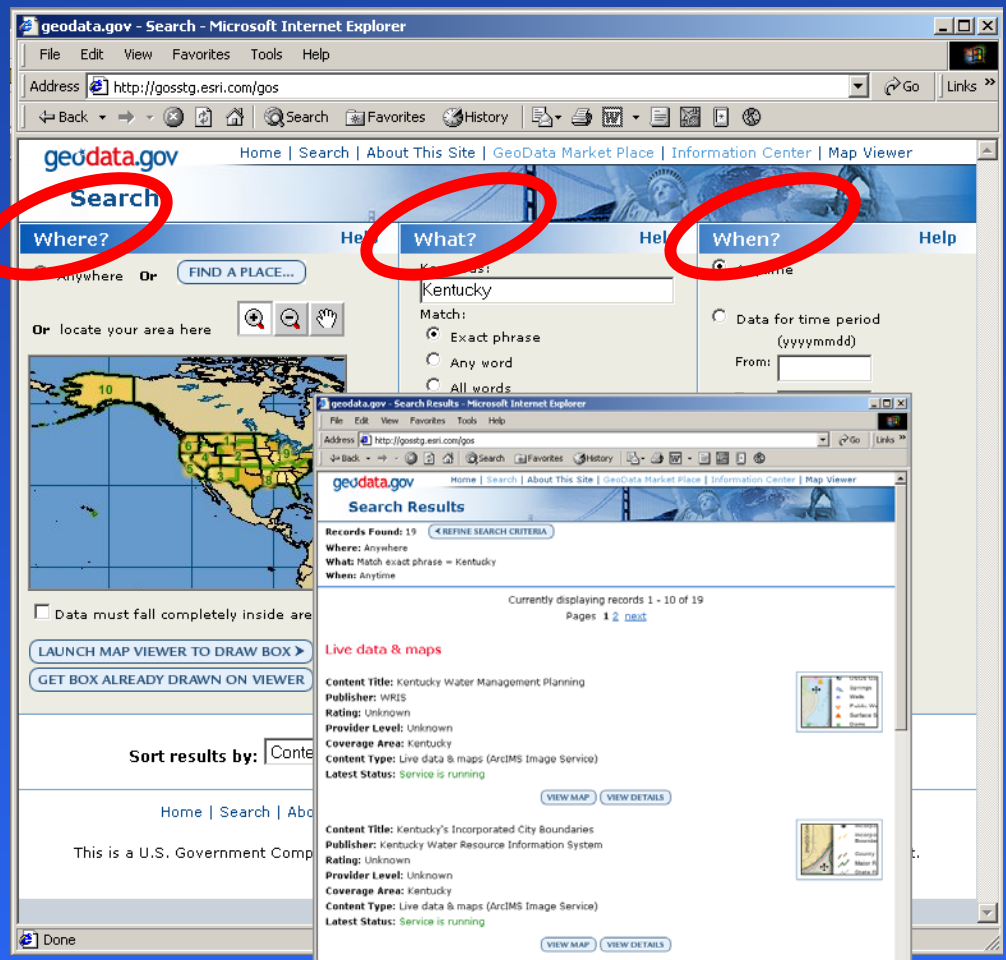
Quick access to Content (2 clicks)



Search for Data

Three search criteria are available for input:

1. Where?
2. What?
3. When?



Search Results

Metadata Results Page

geodata.gov - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://www.geodata.gov/gos

geodata.gov Home | Search | About This Site | The geodata.gov Marketplace | Information Center | Map Viewer

Imagery and Base Maps

Open category: Imagery and Base Maps

- Primary Data
- Other Resources
- About this Category
- Help

Search for more primary data like this:

- Any level
- Federal
- State
- County
- Local
- Tribal
- Commercial
- Organization
- University

Introduction

The Imagery and Base Maps category page provides information about general base maps, place names, description, and characteristics of the land's surface.

Primary Data & Maps

The National Map, USGS

Content Summary: The National Map is a consistent framework for geographic knowledge needed by the Nation. It provides public access to high-quality, geospatial data and information from multiple partners to help inform decision making by resource managers and the public. The National Map enhances America?s ability to access, integrate, and apply geospatial data at global, national and local scales. The U.S. Geological Survey (USGS) is committed to meeting the Nation's needs for current base geographic data and maps. Our vision is that, by working with partners, we will ensure that the Nation has access to current, accurate, and nationally consistent digital data and topographic maps derived from those data.

Content Purpose: Governments depend on a common set of base information that describes the Earth's surface and locates features. They use this information as a tool for economic and community development, land and natural resource management, and health and safety services. Federal functions ranging from emergency management and defense to environmental protection rely on this information. Private industry, nongovernmental organizations, and individual citizens also use the same geographic data. Geographic information underpins an increasingly large part of the Nation's economy. One of the lessons learned from the tragedies of September 11, 2001, is that complete and current public domain base geographic information must be immediately available coast to coast and border to border. The National Map will ensure access to this information.

Publisher: USGS

Rating: Primary

Content Type: Live data & maps (Map Service)

VIEW MAP | VIEW DETAILS | GO TO WEBSITE ➤

USGS Urban Areas Orthoimagery

Content Summary: High-resolution digital orthorectified imagery from aerial photographs or satellite imagery.

Content Purpose: This service will provide some of the feature information now symbolized on topographic maps.

Publisher: USGS

Rating: Primary

Content Type: Live data & maps (Map Service)

VIEW MAP | VIEW DETAILS

Internet

View Data

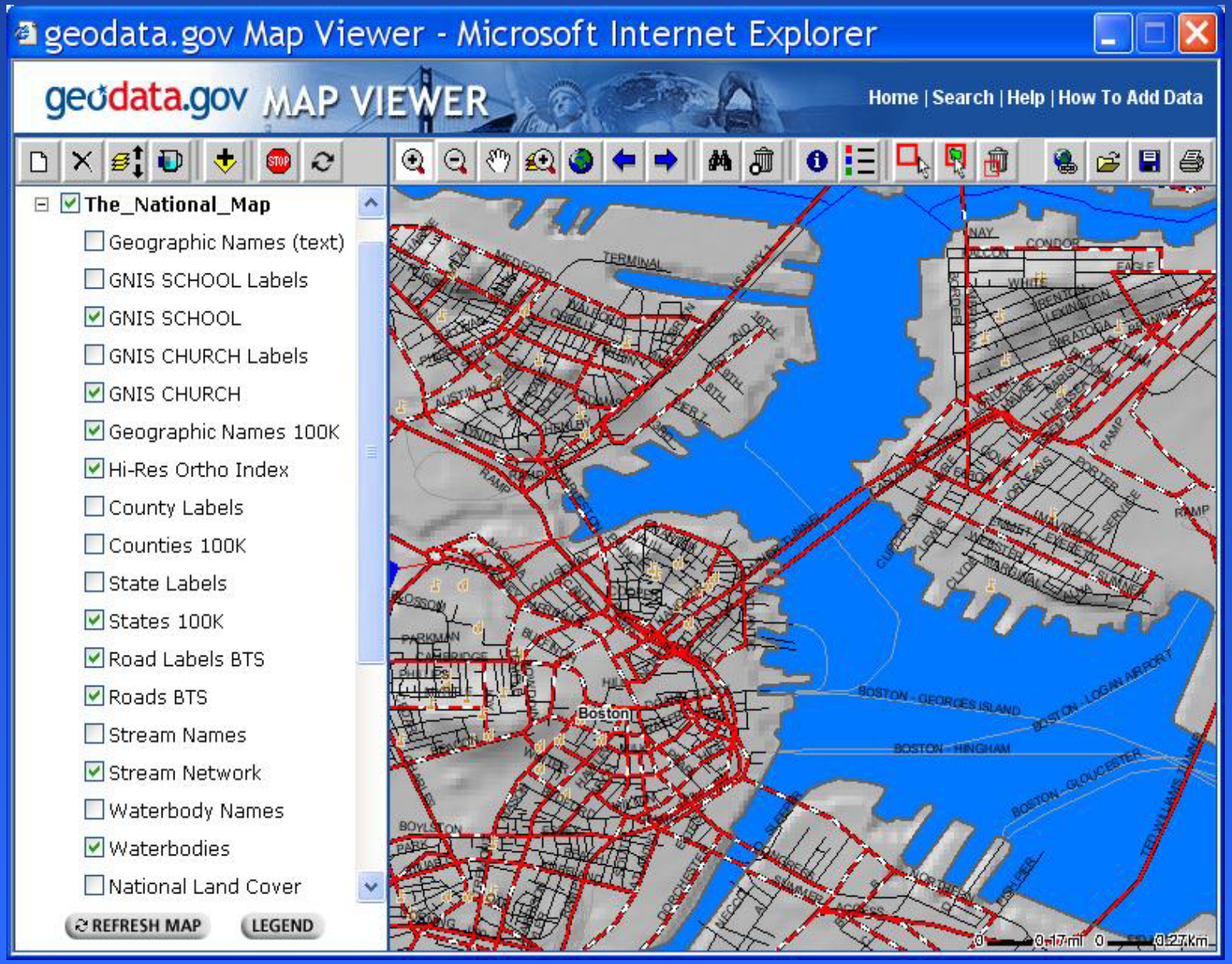
View The National Map and:

- Browse other datasets
- Query map data
- Interact with multiple

  WMS and IMS services

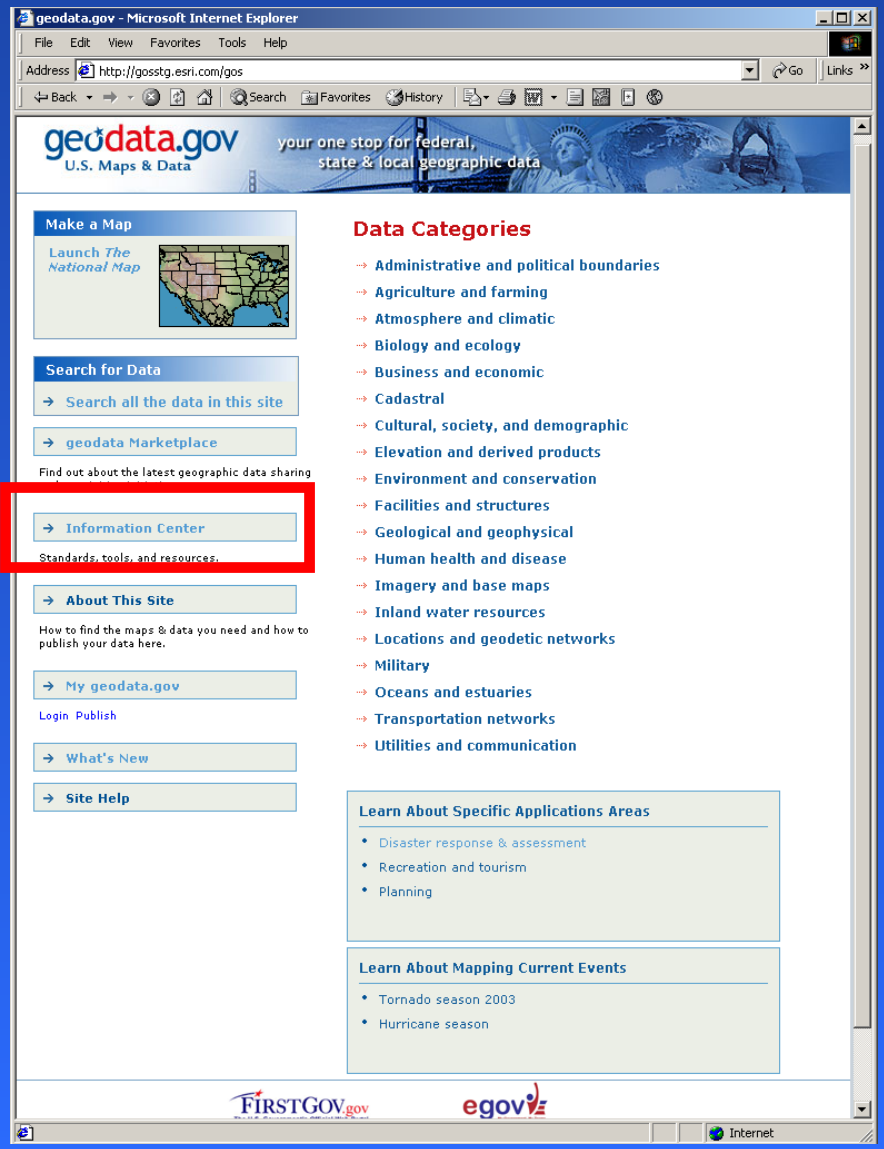
  - overlay maps services
  - set transparency levels

ArcExplorer Web Edition

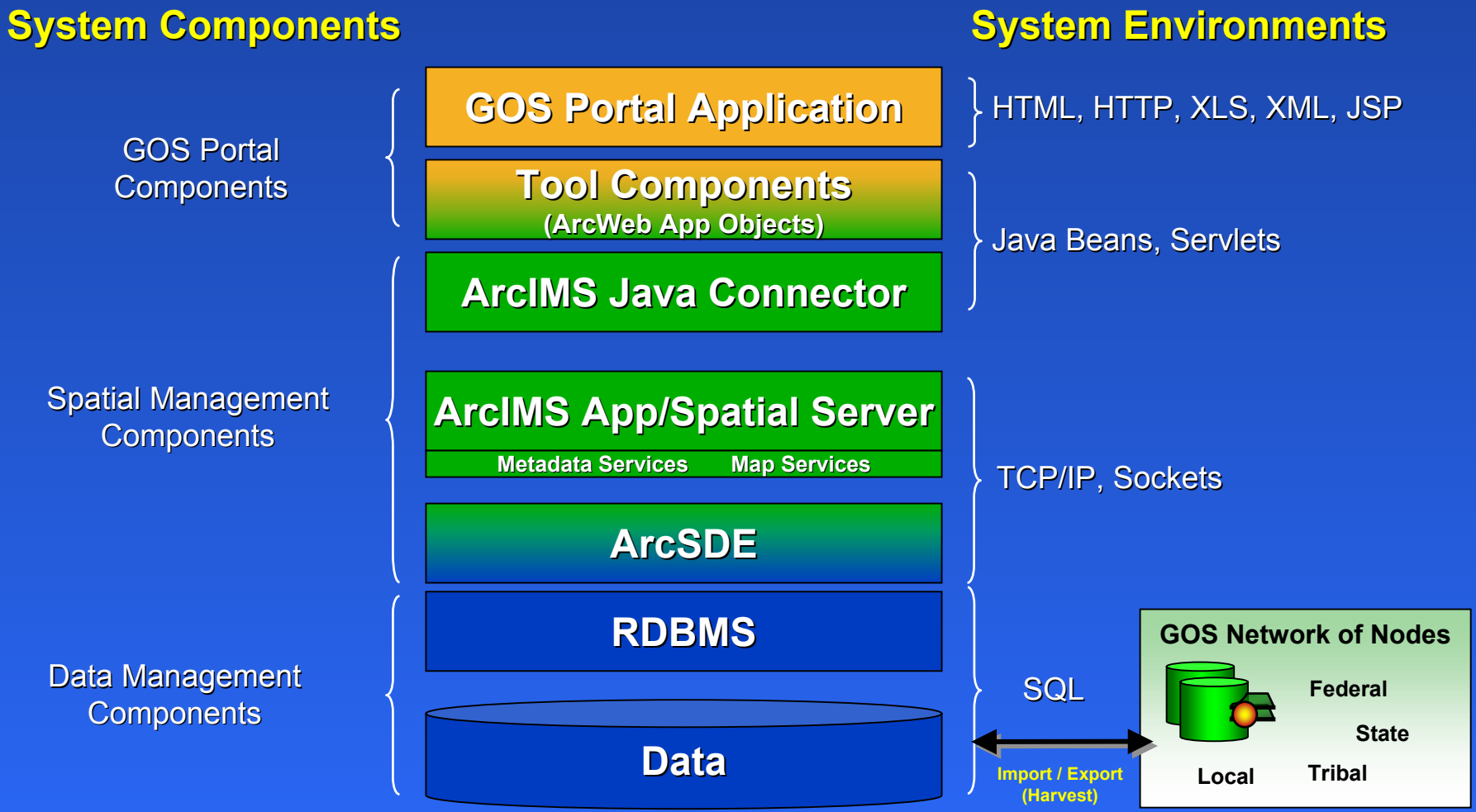


Publish

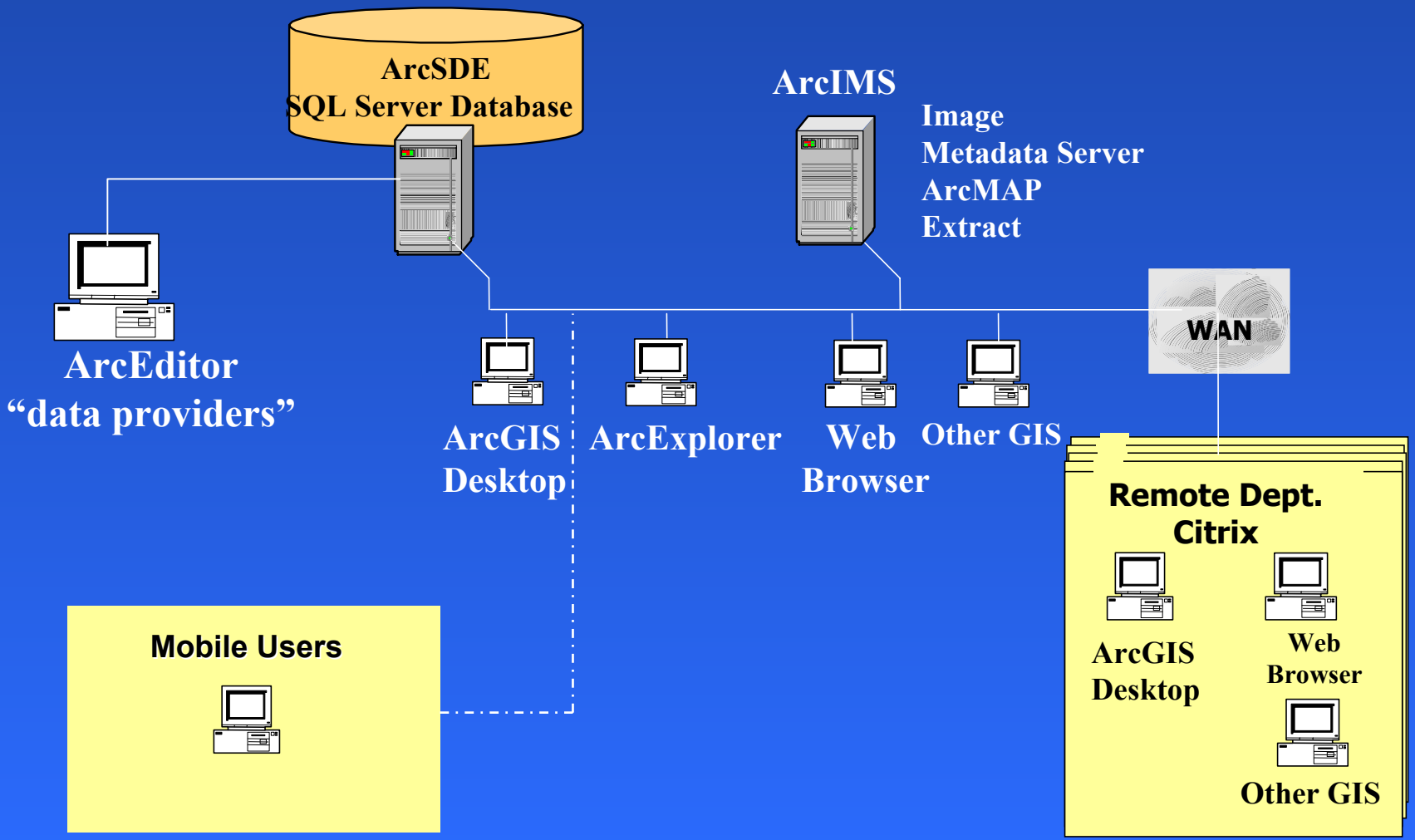
- Geographic datasets
- Images
- Geoservices
- Spatial solutions
- Reference material
- Events and activities
- Planned data acquisitions



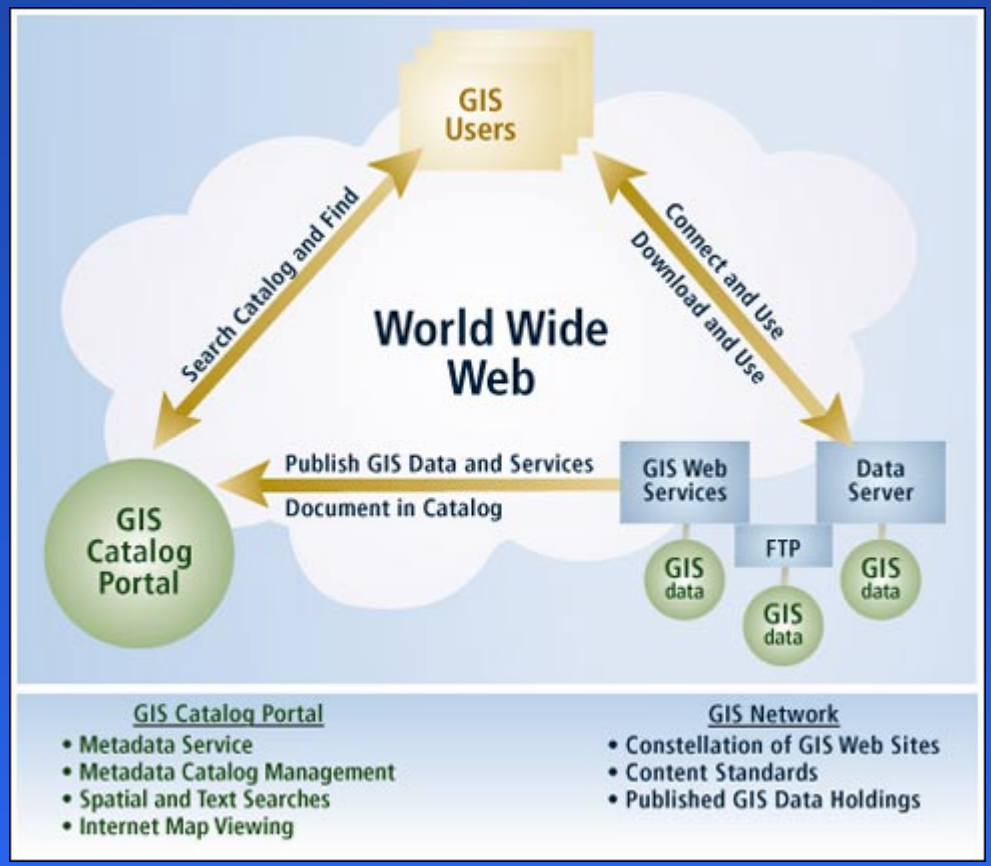
GOS Architecture



Proposed System Architecture



Metadata Catalog Is the Key



… to connecting Users to Services

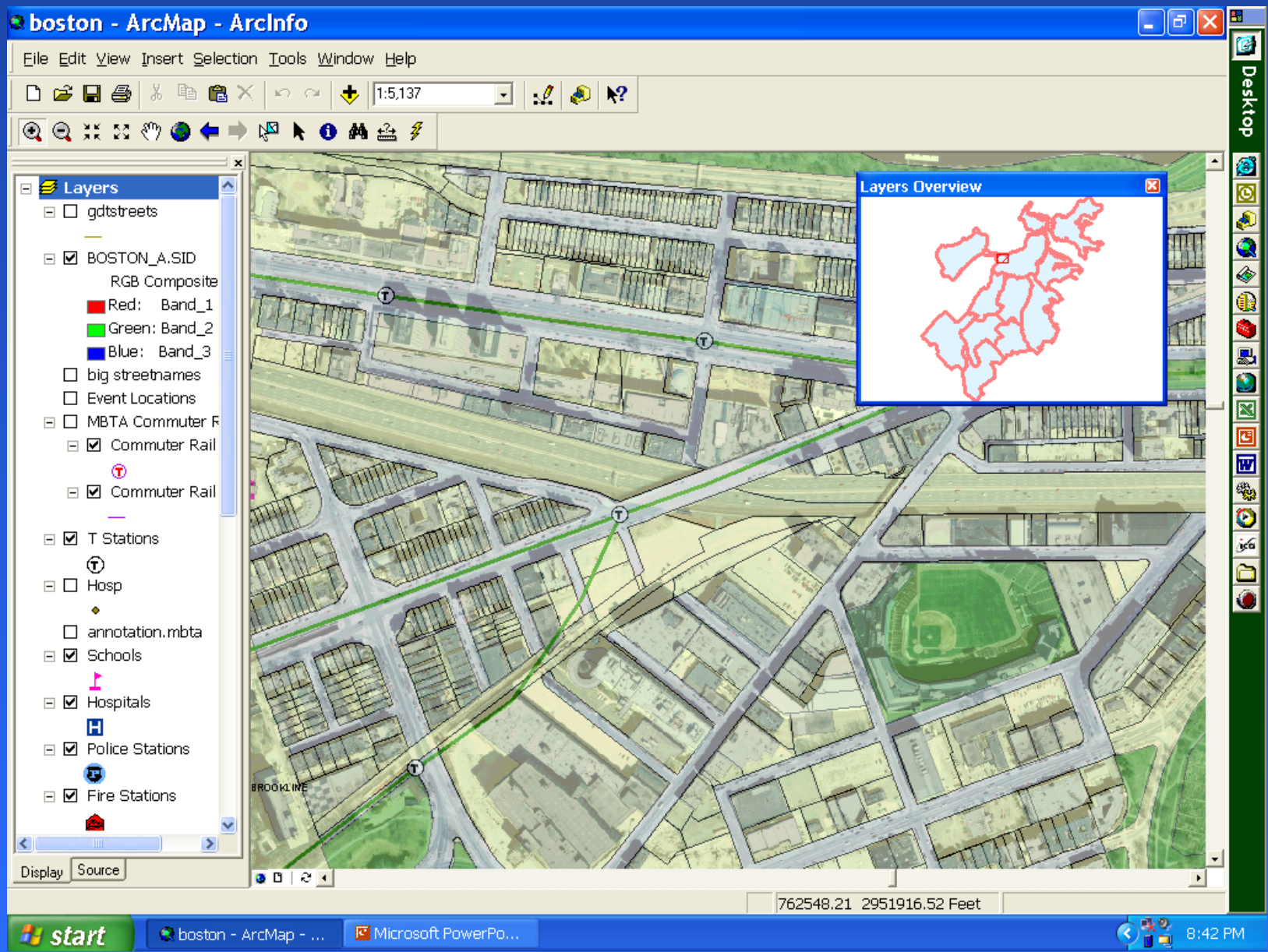
Metadata Requirements

8 Basic Fields of Metadata to Start

1. Title of Dataset
2. Publisher
3. Abstract
4. Purpose
5. Primary Theme (e.g. Environment, Cadastral, Transportation)
6. Content Type (Data:Live,download,offline) (Documents: Map Files, Static Map Images, other documents) (Resources: Applications, Geographic Services)
7. Rating (is the data of primary,secondary or tertiary importance)
8. Spatial Extent of the Data

Metadata Creation Tools

Cartographic Rendering



Initial BOSS Layers

Most Widely Requested

1. Parcels
2. Buildings
3. Street Centerlines
4. Open Space
5. Color Orthophotos

Cartographic Necessity

1. City Blocks
2. Neighborhoods
3. Wards
4. Hydro
5. Other State Layers

Future Phases

We are recommending that future phases include:

1. Automated Data Publishing
2. Direct editing of the spatial database
3. Custom city viewer web mapping application
4. Increased Security Components
5. Interconnectivity with other spatial data repositories such as the National Spatial Data Infrastructure (NSDI), and MassGIS.
6. Data model support, including data models for (Homeland Security, Addressing, Buildings Parcels and many more)